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cidæ are not mentioned by the author); *d*, the Perlariæ; *e*, the Ephemeridæ, and *f*, the Libellulidæ. Three groups remain, "which do not fit well into any of the preceding assemblages,"—*a*, the *Physopoda* (Thrips) [which are simply degraded Lygæid Hemiptera]; *b*, the *Thysanura* [which are unquestionably degraded Neuroptera], and *c*, the *Mallophaga*, or bird-lice [which again are degraded Hemiptera and are so recognized by many eminent entomologists, beginning with Latreille.] This arrangement, so arbitrary and unphilosophical, the author evidently borrows from Gerstaecker in Peters and Carus' Handbook of Zoology. Again, for what reason are the *Arthrogastra* (Scorpio, Chelifer, Phrynus, Phalangium, and Galeodes) placed above the Spiders (Araneina), when structurally they are so obviously inferior to the latter, as the embryology of the two groups (of which not a word is said) decides with so much certainty?

We imagine the author treats that strange form, Sagitta, much as Thrips and the Case-flies are disposed of, because it does not "fit well" into some other order or class, not agreeing, forsooth, with the ordinary "definitions" of such order or class (these "definitions" are the bane of zoölogy studied as a science.) It is, indeed, thrown into a separate class, the *Chatognatha* of Rudolph Leuckart, and placed between the worms and Crustacea. Would it not be as philosophical to wait until the embryology of this singular form had been studied before isolating it from either the Crustacea (for it may turn out to be a Copepodous crustacean allied to Penella, as Prof. Agassiz has suggested) or the Annelida, where the weight of authority perhaps locates it.

This book, so interesting and suggestive, yet so unsatisfactory, marks a transitional era in zoölogy. Many of the author's views had been published long before the appearance of the present manual, but the volume has been received with such an unquestioning spirit by certain English reviews, that we must enter our protest against many of the author's opinions regarding classification; and if the Cuvierian "branches" are to be demolished, do let us have a reasonable classification substituted, instead of a confused mass of classes and orders, and almost entire disbelief in the existence of archetypal forms, and ideas in creation—for such surely is the tendency of the book.—*To be concluded.*

GUIDE TO THE STUDY OF INSECTS.*—This work, which has been over a year in going through the press, appearing in numbers, has at length been completed and issued from the Naturalist's Book Agency. It comprises 700 octavo pages, with 651 wood-cuts, and eleven plates, illustrating in all 1,238 objects. It is accompanied by a glossary of entomological terms, a calendar of the monthly appearances of insects, and a copious index. Regarding the classification adopted the author states in the preface:

"The succession of the suborders of the hexapodous insects is that proposed by the author in 1863, and the attention of zoologists is called to the division of the Hexapods into two series of suborders, which are characterized on page 104. To the first and highest may be applied Leach's

* A Guide to the Study of Insects. By A. S. Packard, Jr., M. D. 8vo, pp. 700. 1869. Naturalist's Book Agency, Salem. Price, bound, \$6.00.

term **METABOLIA**, as they all agree in having a perfect metamorphosis; for the second and lower series the term **HETEROMETABOLIA** is proposed, as the four suborders comprised in it differ in the degrees of completeness of their metamorphoses, and are all linked together by the structural features enumerated on page 104.

The classification of the Hymenoptera is original with the author, the bees (*Apidae*) being placed highest, and the saw-flies and *Uroceridae* lowest. The succession of the families of the *Lepidoptera* is that now generally agreed upon by entomologists. Loew's classification of the *Diptera*, published in the "Miscellaneous Collections" of the Smithsonian Institution, has been followed with some modifications. Haliday's suggestion that the *Pulicidae* are allied to the *Mycetophilidae* gives a clue to their position in nature among the higher *Diptera*. Leconte's classification of the *Coleoptera* is adopted as far as published by him, *i. e.*, to the *Bruchidae*; for the succeeding families the arrangement of Gerstaecker in Peters and Carus' "Handbuch der Zoologie" has been followed, both being based on that of Lacordaire. The *Hemiptera* are arranged according to the author's views of the succession of the families. The classification of the *Orthoptera* is that proposed by Mr. S. H. Scudder. This succession of families is the reverse of what has been given by recent authors, and is by far the most satisfactory yet presented. The arrangement of the *Neuroptera* (in the Linnæan sense) is that of Dr. Hagen, published in his "Synopsis," with the addition, however, of the *Lepismatidae*, *Campodeæ* and *Poduridae*.

The usual classification of the *Arachnida* is modified by placing the *Phalangidae* as a family among the *Pedipalpi*, and the succession of families of this suborder is suggested as being a more natural one than has been previously given.

The arrangement of the *Araneina*, imperfect as authors have left it, is that adopted by Gerstaecker in Carus and Peters' "Handbuch der Zoologie." In the succession of the families of the *Acarina* the suggestions of Claparede in his "Studien der Acariden," have been followed, and in the preparation of the general account of the *Arachnids* the writer is greatly indebted to Claparede's elaborate work on the "Evolution of Spiders."

Succeeding the preface a page or more is devoted to "acknowledgments," where the author gives the source of each figure in the work. This was the more necessary, as the plan adopted in the two first parts, of giving the name of the person from whose work the figure was borrowed was found to be too cumbrous and expensive.

The "Guide" is already in use in some of our principal colleges and agricultural schools as a text book, or for reference, and seems to have met with favor from teachers and naturalists. The first edition has been about exhausted, and a new one will be issued at an early date. The rapid sale of the book—the first edition being nearly exhausted before the issue of the last part—indicates the large number of lovers of entomology in this country, and the growing sense of the importance of the study of practical entomology by agriculturists.

ORIGIN OF THE BIG MOUND OF ST. LOUIS.*—Professor Spencer Smith, in a paper read before the Academy of Science of St. Louis, states that the noted "Big Mound," has at last been laid low, and its substance used to grade a railroad. The destruction of the mound gave an opportunity to study its structure, and Prof. Smith is satisfied that it did not belong to the group of artificial mounds, but was simply a river deposit, formed of parallel and horizontal strata of clays and sand, the same as found on the banks of the river. But few relics were found during the removal of the mound, and nothing, Mr. Smith thinks, that would indicate anything more than that the Indians took advantage of the mound to bury their dead as they would in any high place.

*Seven pages, 8vo, Oct., 1869. From the Author.